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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,082	03/11/2004	Robert Mergen	MERGEN ET AL 3	5645

7590 10/19/2005

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EXAMINER	
MORILLO, JANELL COMBS	

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/798,082	MERGEN ET AL.	
	Examiner	Art Unit	
	Janelle Combs-Morillo	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20 and 23-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20 and 23-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 20, 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita (US 6,638375) in view of "ASM Handbook: Vol. 18 Friction, Lubrication, and Wear Technology" (hereinafter "ASM Vol. 18") pp 741-753.

Fujita teaches an aluminum bearing alloy comprising: 3-40% Sn, 0.5-7% Si, 0.05-2% Fe (see Fujita at cl. 1), and optionally 0.01-2% Zr (cl. 10) and 0.1-5% Cu, Mg, or Zn, which overlaps the presently claimed alloying ranges of instant claims 20, 23-27. With respect to the overlap in alloying ranges, overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility.

Fujita teaches said alloy is used for a bearing alloy, and teaches said alloy is preferably clad with an aluminum foil bonding layer, to promote bonding between the aluminum bearing alloy and the protective steel shell (column 5 lines 44-68). Fujita does not mention a) said alloy is used as a base layer between the steel shell and a running layer of Pb, Sn, Bi, In, or Cu, or b) eliminating the bonding layer.

Concerning a), though Fujita does not teach the application of a layer of Pb, Sn, Bi, In, or Cu to said base layer Al-Sn-Zr alloy, "ASM Vol. 18" teaches that a thin layer of Sn or Pb can be applied to bearing material systems (see Tables 3 and 4 on p. 747-748), including aluminum alloys with low Sn content, and such bearings "have high tolerances for boundary and thin-film lubrication conditions, and thus can be used under higher loads than can any of the bimetal systems", p 748, 1st column. Comparison of Table 3's bimetal bearing system of steel protective shell with a low-tin aluminum alloy as the surface layer; with Table 4's trimetal bearing system of steel protective shell, low-tin aluminum alloy as the intermediate layer, and a very thin running layer of lead as the surface layer shows that the bearing performance is improved by the application of said running layer of lead. It would have been obvious to one of ordinary skill in the art to apply a thin surface layer of Pb to the base layer taught by Fujita, because "ASM Vol. 18" teaches that said layer allows bearing to be used under higher loads.

Concerning item b), the omission of the bonding layer and its function of improving compatibility is obvious if the function of the step or element is not compulsory, MPEP 2144.04. The prior art teaches that substantially similar Al low Sn alloys have good compatibility (see discussion above, see also ASM Vol. 18 Table 12, Table 4). Note that the omission of an element and retention of its function is an indicia of unobviousness. In re Edge, 359 F.2d 896, 149 USPQ 556 (CCPA 1966). Applicant has not shown unexpected compatibility with regard to the overlapping alloy composition taught by the prior art, in the form of said bearing structure.

3. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita (US 6,638375) and "ASM Vol 18", as applied to claims above, further in view of GB2358406 (GB'406).

Fujita and "ASM Vol 18" teaches an Al-Sn-Si-Fe bearing structure as stated above. Fujita does not mention Sc in said alloy composition. However, GB'406 teaches that 0.015-2.5% Sc can be adding to Al-Sn alloys intended for plain bearings, wherein said Sc addition improves the mechanical properties of the bearing alloy, improves adherence strength between the individual layers, reduces susceptibility to hot tearing, and improves weldability (page 10). It would have been obvious to one of ordinary skill in the art to add Sc to the Al-Sn bearing alloy taught by Fujita because GB'406 teaches said addition improves strength, and improves performance as a bearing layer (see GB'406 at p. 10).

Response to Amendment/Arguments

4. In the response filed on August 4, 2005, applicant amended claim 20, cancelled claims 29-39, and submitted various arguments traversing the rejections of record. The examiner agrees that no new matter has been added.

5. Applicant's argument that the present invention is allowable over the prior art of record because the aluminum bearing alloy taught by Fujita is analogous to the running layer, or that because Fujita teaches a preferred bonding layer in-between the protective shell and the base layer, has not been found persuasive. As stated above, a bearing structure with a protective shell, base layer out the Al-Sn alloy taught by Fujita, and running layer of lead is held to be an obvious expedient of the prior art teachings. Even if Fujita teaches the Al-Sn alloy is used for a running layer, "ASM Vol. 18" clearly shows motivation to apply a thin running layer of lead to a low-tin aluminum alloy bimetal bearing system that has a steel protective shell, thereby forming a trimetal bearing system. In particular, comparison of Table 3's bimetal bearing system of: a)steel

protective shell with b) low-tin aluminum alloy as the surface layer; with Table 4's trimetal bearing system of: a) steel protective shell, b) low-tin aluminum alloy as the intermediate layer, and c) thin running layer of lead as the surface layer, shows that the bearing performance is improved by the application of said running layer of lead to the low-tin alloy layer. The motivation to apply a thin surface layer of Pb to the base layer taught by Fujita is that "ASM Vol. 18" teaches that said layer allows bearing to be used under higher loads.

6. Applicant's argument that the present invention is allowable over the prior art of record because Fujita teaches a bonding layer has not been found persuasive. Applicant has not shown unexpected compatibility with regard to the overlapping alloy composition taught by the prior art, in the form of said bearing structure (see also above discussion).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCM
October 11, 2005

ROY KING
SUPERVISORY PATENT EXAMINER
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